Results of the IMO Video Meteor Network – May 2016

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May started mediocre but improved towards the end of the month significantly. 44 out of 77 cameras in operation managed to observe in twenty or more observing nights. SALSA3 did not experience any break at all, but also observers in Southern Europe (Italy, Portugal) managed to obtain long observing series. The night of May 26/27 was the best with 61 active cameras and over 300 observing hours. However, thanks to the eta Aquariids twice as many meteors were collected on May 5/6 and 6/7, respectively.
With exactly 7,000 hour of effective observing time, 2016 performed a few percent worse than the two preceding years. With the respect to the meteor count it fall just in-between the two.

When talking about major meteor showers, a European observer will immediately think of the Quadrantids (QUA), Perseids (PER) and Geminids (GEM), but for southern hemisphere observers the eta Aquariids (ETA) of May are much more attractive. Before we analyze if they may also be considered a major shower, we first want to have a look at the overall ETA activity profile for 2016. Around April 26, at a solar longitude of 37°, the Aquariids start to stand out from the sporadic background. On May 2 they reach already a flux density of twenty meteoroids per 1,000 km^2 and hour, and two days later the peak time is starts, which lasts for about three days. Only a full week later the flux density drops below twenty again, and at the start of the third May decade or at solar longitude 60° the activity vanishes in the sporadic background.

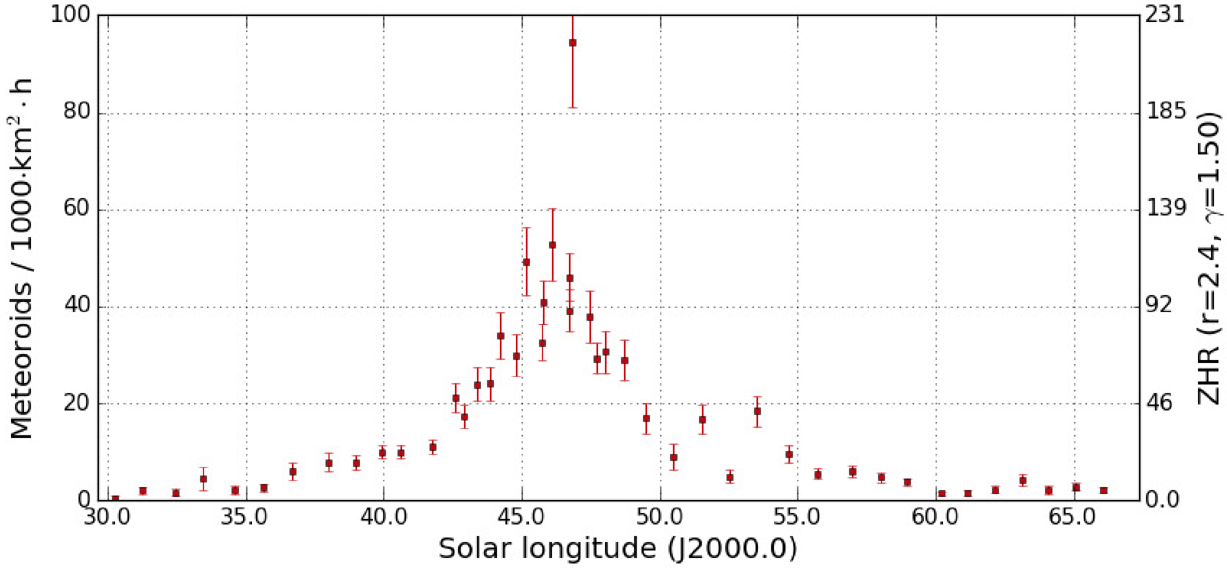

***Figure 1:** Flux density profile of the eta Aquariids in 2016, obtained from observation of the IMO video network*

Particularly prominent in 2016 is a short peak of up to 90 meteoroids per 1,000 km^2 and hour in the morning hours of May 7. This value is impressive, but it is not exceptional for the eta Aquariids. Already in 2012 we measured a similar flux density at about the same time, and one year later on May 5 the shower clearly passed the 100 mark. The 2016 peak occurred once more at the end of the European observing window, when only few cameras were still activity and larger error bars are possible.

Figure 2 shows the details for the first decade of May in the years 2011 to 2016. Since the peak activity changes significantly from one year to the next, there is only little value in creating an average activity profile.

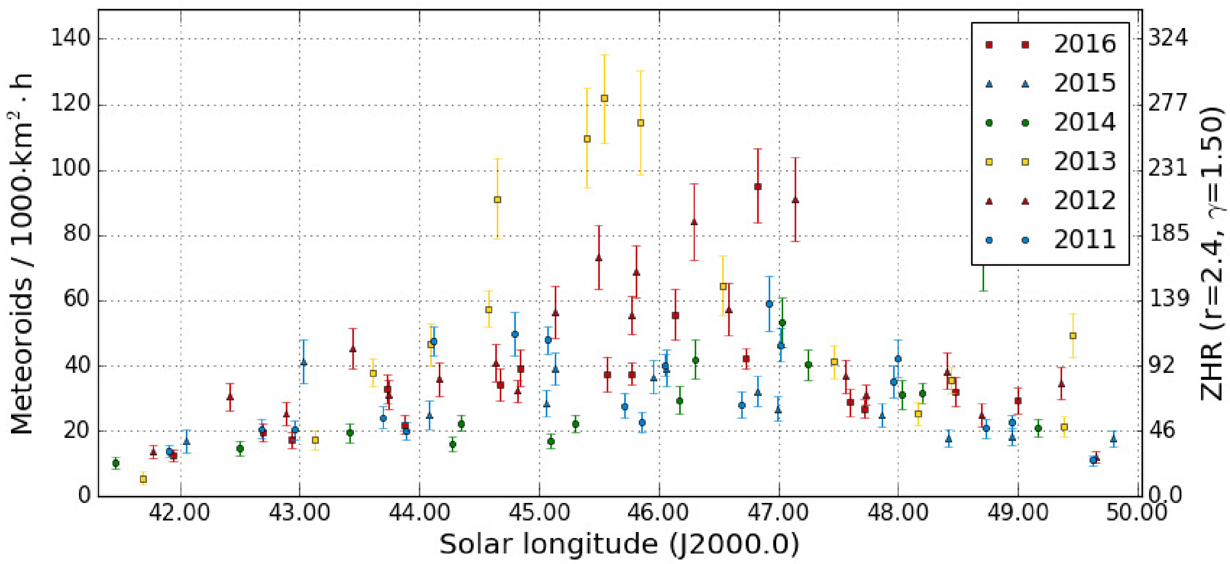

Figure 2: *Comparison of the flux density profile of the eta Aquariids in the first May decade 2011 to 2016, obtained from observation of the IMO video network*

Now back to the question if the eta Aquariids belong to the major showers or if they play only in the "2nd division". An attractive shower for visual observers needs to provide high rates in the optical range for a long time. So we calculated from the flux density profiles since 2011 the peak time, peak flux density and full width at half maximum of QUA, ETA, PER and GEM. The problem was that we have no continuous activity profiles, but that only the European longitudes are well covered. For this reason, we did not rely on the observed peak flux density, but we fitted an exponential function to the ascending and descending activity branch and defined the intersection point of both as the peak. That works in some case better than in others. In particular for the Quadrantids with their short activity interval we are often missing important parts of the profile and need to extrapolate the existing data significantly. Also additional peaks e.g. by dust trail encounters may distort the result. Such uncertain figures are put in brackets in table 1.
As consistency check we calculated for each shower an average profile over all data (even though this includes averaging over years with big differences in activity as remarked before). Those average values are printed in bold in table 1.

Table 1: *Peak time, peak flux density and full width at half maximum (FWHM) of the Quadrantids, eta Aquariids, Perseids and Geminids since 2011. Figures in brackets have larger uncertainties, figures printed in bold are obtained from an averaged activity profile over all years.*

Shower	**Year**	**Point in Time [° SL]**	**Flux Density [1.000km^{-2}h^{-1}]**	**FWHM [° SL]**
QUA	*(2012)*	*(283.18)*	*(25.0)*	*(0.37)*
	(2013)	*(282.94)*	*(27.3)*	*(0.35)*
	(2014)	*(283.09)*	*(54.8)*	*(0.37)*
	2015	283.14	10.0	0.57
	(2016)	*(283.22)*	*(36.7)*	*(0.39)*
	2012-2016	**283.23**	**30.0**	**0.39**
ETA	2011	45.86	48.9	4.79
	2012	46.11	70.9	4.29
	(2013)	*(45.60)*	*(120.0)*	*(2.47)*
	(2014)	*(47.23)*	*(43.7)*	*(7.07)*
	2015	46.33	39.3	6.08
	2016	46.56	54.8	4.08
	2011-2016	**46.18**	**52.5**	**4.89**

PER	*(2011)*	*(140.04)*	*(43.8)*	*(1.62)*
	(2012)	*(140.08)*	*(37.3)*	*(2.06)*
	2013	140.23	34.1	2.10
	2014	140.15	49.1	1.88
	2015	139.95	51.0	1.33
	(2016)	*(139.64)*	*(48.7)*	*(1.41)*
	2011-2016	**139.92**	**45.4**	**1.41**
GEM	*(2011)*	*(262.12)*	*(100.1)*	*(1.04)*
	2012	262.24	82.4	0.89
	2013	261.98	78.9	0.98
	(2014)	*(262.18)*	*(79.6)*	*(1.06)*
	(2015)	*(262.15)*	*(74.0)*	*(1.05)*
	2011-2015	**262.19**	**76.3**	**1.26**

In figure 3 and 4 we present the results graphically. Figure 3 plots the peak flux density vs. the full width at half maximum, figure 4 vs. the time of peak (relative to the average peak solar longitude).

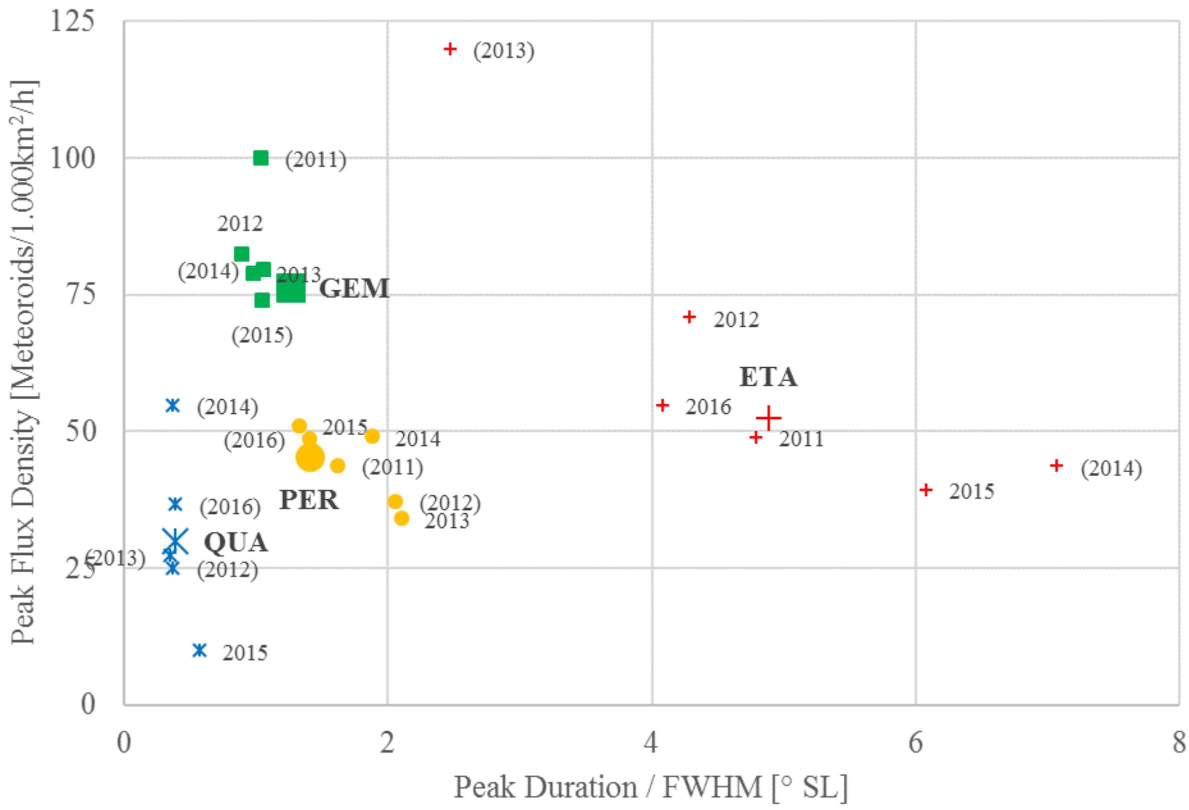

Figure 3: *Comparison between Quadrantids, eta Aquariids, Perseids and Geminids with respect to their peak flux density and FWHM.*

What can we learn from the graphs? In figure 3, each shower forms his own cluster.
The Quadrantids have a FWHM of just about 0.4° solar longitude, and they reach an average peak flux density of 30 meteoroids per 1,000 km^2 and hour. We reported already before on the large scatter in QUA peak activity.
With a FWHM of 1.3° solar longitude, the Geminids last three times as long, and with 75 they reach the highest flux density of all considered showers. There is only little scatter in strength and duration of the peak.
The Perseids are slightly longer active with a FWHM of 1.4° solar longitude, and their peak flux density of about 45 meteoroids per 1,000 km^2 and hour is clearly smaller. The scatter is about as large as in case of the Geminids.
The flux density of the eta Aquariids is a bit higher (over 50 on average) and the mean duration of almost 5° solar longitude is unrivalled. 2013 was totally exceptional.

Thus, the eta Aquariids rank at least second – if there was not the problem of the short observing window. Perseids and Geminids can be observed in central Europe all night long. The Quadrantids reach sufficient radiant altitudes after midnight, but in our latitudes the eta Aquariids can only be observed at dawn with low radiant altitudes. If the radiant was located farther away from the Sun at a larger declination, the Aquariids would beat all other showers. In the given situation, they still belong to the "premier league" but they remain a southern hemisphere shower.
If you ask yourself why the data points in figure 3 have a tendency from up left to down right for each cluster: The higher the peak activity, the larger is also the FWHM rate and the shorter is the time interval with such a high activity.

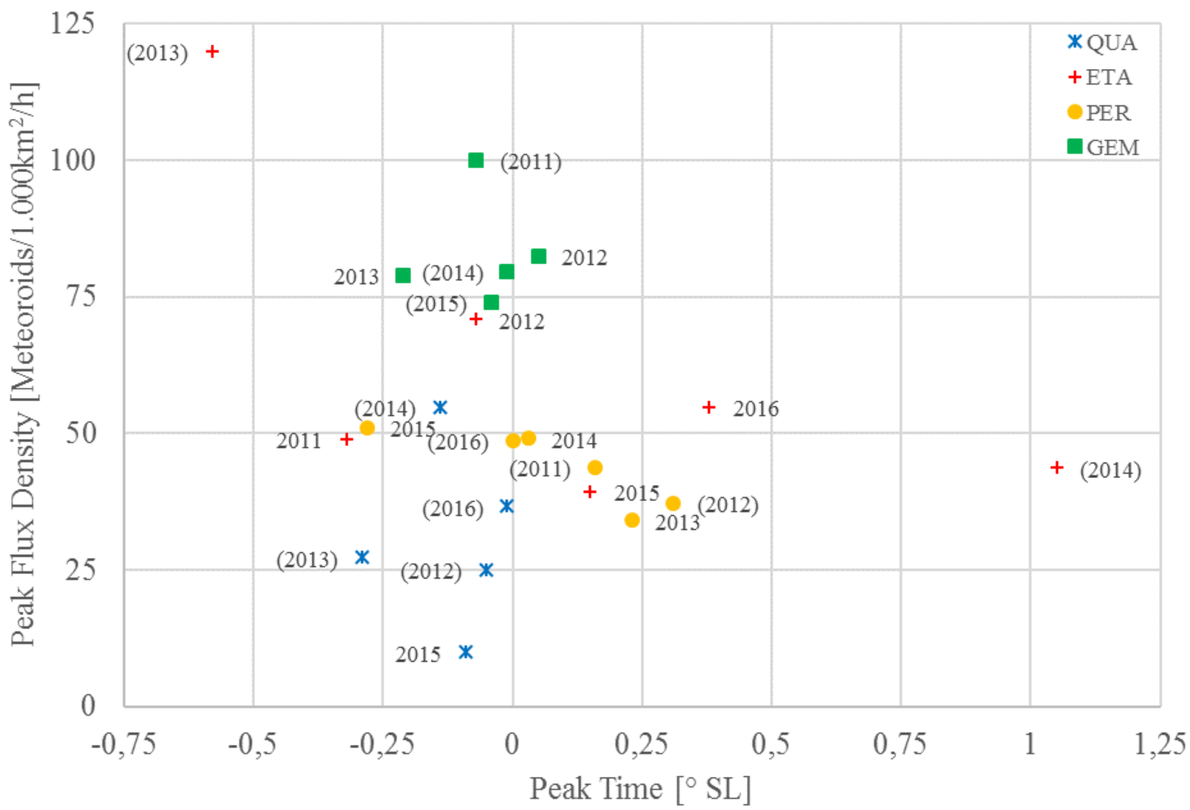

Figure 4: *Comparison between Quadrantids, eta Aquariids, Perseids and Geminids with respect to their peak flux density and time of peak relative to the mean profile.*

Figure 4 shows no clear trend. Early peaks of the eta Aquariids and Perseids seem to be somewhat more intense than later peaks, but that are not really sound dependencies given the small amount of data.

Complementary, we will have a look at a really small shower. The eta Lyrids are active just a few days after the eta Aquariids. Their activity is not only significantly smaller, but shows also fewer variations. Figure 5 compares the activity profile of 2016 with the average profile of 2011 till 2015. There is overall good agreement – only the peak rates between 49 and 50° solar longitude are somewhat smaller in 2016.

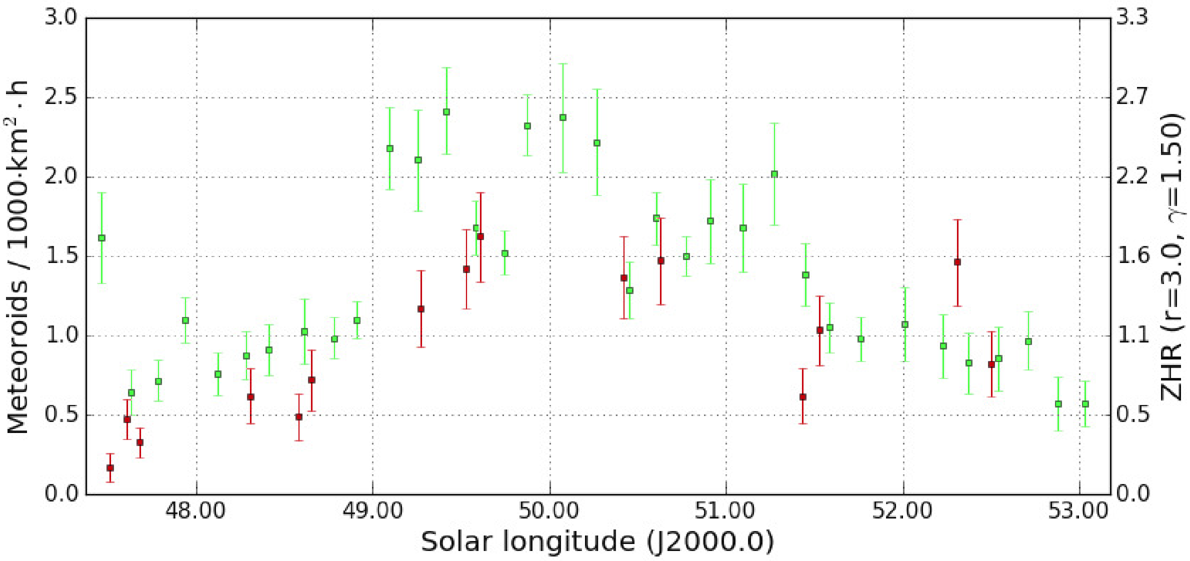

Figure 5: *Comparison of the flux density profile of the eta Lyrids in 2016 with the average profile of 2011-2015 obtained from observation of the IMO video network.*

With respect to software, there were no activities in the last month, but we experimented with new hardware. Already for some years, MetRec supports to use more than one Matrox framegrabber per computer. Some observers run two instances of MetRec on the same PC, but there have been repeated reports on stability issues.
To analyze the problem, I acquired a used FSC Celsius W370 midi tower with Win 7 / 32 bit, 4 PCI slots, a quad Core CPU with 4x2.4 GHz clock rate and 4 GB RAM. This computer was equipped with the maximum possible number of 4 framegrabbers. Indeed, there were first severe stability issues and the computer froze quickly. After an intensive root cause analysis it was clear that shared interrupt requests (IRQs) are to blame for that. Hence, the external PCI-E graphics card was removed and replaced by internal on-board graphics. Additionally, a number of hardware components that used the same IRQs as the Matrox framegrabbers were deactivated in Windows (USB ports and PCI bridges). AHCI had to be deactivated in the BIOS for the SATA HDD controller as well. In the end, a unique IRQ was exclusively assigned to each framegrabber, and then the system was running stable in a test period of several weeks. Performance issues were not observed either – the CPU load was typically only about 30%, so that in parallel old observation could be re-processed with PostProc, for example. This proves, that in the maximum configuration four Matrox framegrabbers and MetRec instances run stable and without bottlenecks on a single PC if all hardware conflicts are solved.

1. Observers

Code	Name	Place	Camera	FOV [^{o2}]	St.LM [mag]	Eff.CA [km^2]	Nights	Time [h]	Meteors
ARLRA	Arlt	Ludwigsfelde/DE	LUDWIG2 (0.8/8)	1475	6.2	3779	26	105.7	431
BANPE	Bánfalvi	Zalaegerszeg/HU	HUVCSE01 (0.95/5)	2423	3.4	361	8	3.5	23
BERER	Berkó	Ludanyhalaszi/HU	HULUD1 (0.8/3.8)	5542	4.8	3847	6	35.5	109
BOMMA	Bombardini	Faenza/IT	MARIO (1.2/4.0)	5794	3.3	739	24	101.5	282
BREMA	Breukers	Hengelo/NL	MBB3 (0.75/6)	2399	4.2	699	19	83.4	117
BRIBE	Klemt	Herne/DE	HERMINE (0.8/6)	2374	4.2	678	24	102.5	210
		Berg. Gladbach/DE	KLEMOI (0.8/6)	2286	4.6	1080	18	80.3	124
CASFL	Castellani	Monte Baldo/IT	BMH1 (0.8/6)	2350	5.0	1611	23	128.6	271
			BMH2 (1.5/4.5)*	4243	3.0	371	20	95.2	134
CRIST	Crivello	Valbrevenna/IT	BILBO (0.8/3.8)	5458	4.2	1772	17	67.9	186
			C3P8 (0.8/3.8)	5455	4.2	1586	18	78.7	172
			STG38 (0.8/3.8)	5614	4.4	2007	28	117.5	410
DONJE	Donati	Faenza/IT	JENNI (1.2/4)	5886	3.9	1222	26	115.9	361
ELTMA	Eltri	Venezia/IT	MET38 (0.8/3.8)	5631	4.3	2151	14	67.0	154
FORKE	Förster	Carlsfeld/DE	AKM3 (0.75/6)	2375	5.1	2154	20	90.9	197
GONRU	Goncalves	Tomar/PT	TEMPLAR1 (0.8/6)	2179	5.3	1842	25	128.2	290
			TEMPLAR2 (0.8/6)	2080	5.0	1508	27	127.6	214
			TEMPLAR3 (0.8/8)	1438	4.3	571	17	76.6	85
			TEMPLAR4 (0.8/3.8)	4475	3.0	442	25	110.2	193
			TEMPLAR5 (0.75/6)	2312	5.0	2259	24	94.4	170
GOVMI	Govedic	Sredisce ob Dr./SI	ORION2 (0.8/8)	1447	5.5	1841	24	101.0	158
			ORION3 (0.95/5)	2665	4.9	2069	19	67.1	88
			ORION4 (0.95/5)	2662	4.3	1043	23	73.3	105
HERCA	Hergenrother	Tucson/US	SALSA3 (0.8/3.8)	2336	4.1	544	31	260.8	442
IGAAN	Igaz	Budapest/HU	HUPOL (1.2/4)	3790	3.3	475	13	64.7	25
JONKA	Jonas	Budapest/HU	HUSOR (0.95/4)	2286	3.9	445	18	95.7	87
			HUSOR2 (0.95/3.5)	2465	3.9	715	21	93.6	90
KACJA	Kac	Kamnik/SI	CVETKA (0.8/3.8)	4914	4.3	1842	16	87.2	233
		Ljubljana/SI	ORION1 (0.8/8)	1399	3.8	268	19	86.4	171
		Kamnik/SI	REZIKA (0.8/6)	2270	4.4	840	16	82.4	313
			STEFKA (0.8/3.8)	5471	2.8	379	14	70.4	111
KOSDE	Koschny	Izana Obs./ES	ICC7 (0.85/25)*	714	5.9	1464	1	8.1	54
		La Palma / ES	ICC9 (0.85/25)*	683	6.7	2951	22	135.5	1361
		Izana Obs./ES	LIC1(2.8/50)*	2255	6.2	5670	7	55.6	496
		La Palma / ES	LIC2 (3.2/50)*	2199	6.5	7512	28	195.5	1566
LOJTO	Łojek	Grabniak/PL	PAV57 (1.0/5)	1631	3.5	269	24	129.1	260
LOPAL	Lopes	Lisboa/PT	NASO1 (0.75/6)	2377	3.8	506	19	100.0	47
MACMA	Maciejewski	Chelm/PL	PAV35 (0.8/3.8)	5495	4.0	1584	28	108.2	304
			PAV36 (0.8/3.8)*	5668	4.0	1573	22	101.3	206
			PAV43 (0.75/4.5)*	3132	3.1	319	27	142.9	176
			PAV60 (0.75/4.5)	2250	3.1	281	28	138.3	310
MARGR	Maravelias	Lofoupoli/GR	LOOMECON (0.8/12)	738	6.3	2698	7	44.9	38
MARRU	Marques	Lisbon/PT	CAB1 (0.8/3.8)	5291	3.1	467	27	156.3	265
			RAN1 (1.4/4.5)	4405	4.0	1241	21	104.8	162
MASMI	Maslov	Novosimbirsk/RU	NOWATEC (0.8/3.8)	5574	3.6	773	18	52.6	131
MOLSI	Molau	Seysdorf/DE	AVIS2 (1.4/50)*	1230	6.9	6152	24	93.3	494
			ESCIMO2 (0.85/25)	155	8.1	3415	20	90.0	172
			MINCAM1 (0.8/8)	1477	4.9	1084	19	87.9	250
		Ketzür/DE	REMO1 (0.8/8)	1467	6.5	5491	25	115.8	496
			REMO2 (0.8/8)	1478	6.4	4778	25	116.0	487
			REMO3 (0.8/8)	1420	5.6	1967	4	12.6	32
			REMO4 (0.8/8)	1478	6.5	5358	24	115.4	492
MORJO	Morvai	Fülöpszallas/HU	HUFUL (1.4/5)	2522	3.5	532	23	105.8	93
MOSFA	Moschini	Rovereto/IT	ROVER (1.4/4.5)	3896	4.2	1292	17	8.2	50
OTTMI	Otte	Pearl City/US	ORIE1 (1.4/5.7)	3837	3.8	460	18	100.3	99
PERZS	Perkó	Becsehely/HU	HUBEC (0.8/3.8)*	5498	2.9	460	22	104.1	231
ROTEC	Rothenberg	Berlin/DE	ARMEFA (0.8/6)	2366	4.5	911	18	51.1	102
SARAN	Saraiva	Carnaxide/PT	RO1 (0.75/6)	2362	3.7	381	19	94.3	102
			RO2 (0.75/6)	2381	3.8	459	19	97.7	149
			RO3 (0.8/12)	710	5.2	619	20	111.7	208
			SOFIA (0.8/12)	738	5.3	907	22	101.9	101
SCALE	Scarpa	Alberoni/IT	LEO (1.2/4.5)*	4152	4.5	2052	19	63.6	58
SCHHA	Schremmer	Niederkrüchten/DE	DORAEMON (0.8/3.8)	4900	3.0	409	20	66.7	111
SLAST	Slavec	Ljubljana/SI	KAYAK1 (1.8/28)	563	6.2	1294	20	81.3	112
			KAYAK2 (0.8/12)	741	5.5	920	11	49.3	43
STOEN	Stomeo	Scorze/IT	MIN38 (0.8/3.8)	5566	4.8	3270	26	83.8	323
			NOA38 (0.8/3.8)	5609	4.2	1911	25	94.7	323
			SCO38 (0.8/3.8)	5598	4.8	3306	28	98.5	333
STRJO	Strunk	Herford/DE	MINCAM2 (0.8/6)	2354	5.4	2751	20	80.9	265
			MINCAM3 (0.8/6)	2338	5.5	3590	21	91.8	170
			MINCAM4 (1.0/2.6)	9791	2.7	552	20	96.1	73
			MINCAM5 (0.8/6)	2349	5.0	1896	19	90.6	155
			MINCAM6 (0.8/6)	2395	5.1	2178	20	80.4	138
TEPIS	Tepliczky	Agostyan/HU	HUAGO (0.75/4.5)	2427	4.4	1036	19	97.5	80
			HUMOB (0.8/6)	2388	4.8	1607	24	97.5	148
TRIMI	Triglav	Velenje/SI	SRAKA (0.8/6)*	2222	4.0	546	17	24.8	58
YRJIL	Yrjölä	Kuusankoski/FI	FINEXCAM (0.8/6)	2337	5.5	3574	13	29.9	46
Sum							31	7000.3	17326

* active field of view smaller than video frame

2. Observing Times (h)

May	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	6.1	6.0	1.2	3.2	5.6	5.6	5.4	5.5	5.5	5.4	5.3	5.1	5.2	3.5	2.8
BANPE	-	-	-	-	-	0.5	0.6	0.5	-	-	-	-	-	-	0.5
BERER	-	-	-	-	-	-	-	-	-	-	-	-	-	6.7	4.6
BOMMA	-	1.6	-	3.1	7.8	7.9	0.5	-	0.2	-	-	0.2	-	0.2	0.7
BREMA	6.9	-	6.7	6.6	6.6	6.5	6.5	-	5.9	0.4	6.0	2.3	-	5.0	5.6
BRIBE	7.0	1.3	6.9	6.8	6.7	6.6	6.6	6.5	5.4	0.8	6.3	6.2	2.9	3.7	2.4
	6.9	3.4	6.8	6.7	6.5	6.6	6.5	6.4	-	2.8	6.2	5.9	4.1	-	1.4
CASFL	-	7.5	8.0	2.3	7.1	7.8	7.6	-	-	1.2	-	6.5	2.2	2.5	5.0
	-	7.1	7.1	0.7	6.6	7.6	7.2	-	-	-	-	4.2	0.5	-	4.6
CRIST	6.3	7.3	6.6	7.6	7.6	3.3	4.4	-	-	-	-	-	4.1	0.8	4.0
	2.2	5.9	6.0	7.6	7.5	0.6	1.1	-	-	-	-	-	-	0.9	0.8
	5.4	7.6	7.0	7.6	7.6	3.9	5.5	-	0.2	-	-	0.7	4.1	0.9	5.3
DONJE	-	1.2	0.6	3.8	7.9	7.8	1.2	0.2	-	0.4	-	0.4	-	1.1	2.5
ELTMA	-	3.0	-	-	7.7	7.8	7.6	-	-	-	-	3.0	-	-	-
FORKE	6.2	7.1	-	-	6.9	6.8	6.6	6.6	6.6	6.5	6.4	-	-	0.4	-
GONRU	8.4	8.4	8.3	-	-	3.6	-	-	3.5	4.8	2.1	4.7	5.3	1.3	4.8
	8.5	8.5	8.4	-	-	3.6	-	-	3.0	4.0	3.0	4.5	4.9	1.6	4.6
	8.5	8.4	8.4	-	-	2.1	1.2	1.4	-	2.6	-	3.3	-	-	-
	8.4	8.4	8.3	-	-	1.6	-	-	2.0	2.7	-	3.1	4.2	1.3	3.5
	8.5	8.4	8.2	-	-	2.7	1.2	2.1	2.1	2.6	-	3.7	5.3	1.3	3.3
GOVMI	-	2.9	0.2	-	3.3	3.5	7.2	3.2	1.7	-	-	4.7	2.2	-	6.6
	-	2.2	-	-	1.9	-	6.8	1.5	3.8	-	-	0.4	-	-	-
	-	2.3	0.2	-	1.6	2.4	7.2	-	3.6	-	-	3.0	-	-	3.5
HERCA	8.4	9.3	9.3	9.2	9.2	9.2	9.0	8.9	9.1	9.1	9.0	8.4	9.0	8.4	1.9
IGAAN	-	-	-	-	5.2	-	3.6	3.2	-	-	3.9	-	-	-	-
JONKA	-	-	-	2.9	5.4	-	4.4	2.7	-	-	2.7	-	-	6.7	6.9
	-	-	-	2.4	5.6	-	2.6	1.4	2.4	-	2.4	-	-	5.8	6.8
KACJA	-	-	2.7	-	5.4	7.4	5.8	6.6	6.8	-	-	-	-	-	-
	-	-	5.5	-	6.9	7.5	7.3	4.9	3.0	0.7	-	0.3	-	-	-
	-	-	1.8	-	5.4	6.9	5.9	6.6	5.8	-	-	-	-	-	-
	-	-	-	-	-	-	6.8	6.6	5.9	-	-	-	-	-	-
KOSDE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8.6	8.6	-	8.6	8.5	8.5	5.8	3.7	0.3	-	4.1	8.3	8.3	8.3	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8.8	8.7	-	8.7	8.6	8.5	5.8	3.6	-	-	2.2	5.9	8.3	8.4	7.0
LOJTO	-	-	6.6	5.7	0.1	6.7	6.1	6.7	6.3	6.6	6.7	2.9	-	-	6.6
LOPAL	6.3	7.6	5.9	-	-	-	-	1.2	-	1.7	1.9	-	-	5.5	7.4
MACMA	0.2	6.9	1.6	2.3	4.6	2.8	0.6	5.5	6.5	6.4	6.4	6.3	-	-	2.4
	1.3	5.8	3.8	4.4	3.2	4.4	1.5	5.0	6.5	6.0	6.3	6.2	-	-	5.5
	1.9	6.1	5.7	5.6	4.2	4.7	1.9	6.1	6.7	6.2	6.6	6.5	-	-	6.1
	1.7	6.3	5.0	4.9	4.0	5.0	1.2	5.8	6.5	6.2	6.1	6.3	-	-	6.1
MARGR	5.8	5.3	-	-	-	-	5.7	-	-	-	-	-	-	-	-
MARRU	8.6	8.5	8.4	-	-	4.6	1.0	-	4.3	5.6	5.5	6.6	6.6	8.0	7.5
	8.6	8.5	5.9	0.3	-	-	-	0.8	-	-	1.0	-	2.3	6.9	7.8
MASMI	2.3	2.0	4.6	-	5.3	0.7	0.5	1.7	3.6	3.7	0.8	3.7	4.2	-	-
MOLSI	4.4	6.5	-	6.0	6.4	6.4	6.3	6.2	6.2	5.7	1.9	-	-	3.4	-
	2.7	7.1	-	6.1	7.0	6.9	6.9	6.8	6.7	6.0	2.0	-	-	1.9	-
	4.2	6.8	-	5.9	6.6	6.6	6.6	6.5	6.4	5.6	2.1	-	-	3.0	-
	6.6	6.5	-	6.4	6.3	6.2	6.1	6.1	6.0	5.9	5.9	3.6	5.7	2.6	2.8
	6.7	6.6	-	6.5	6.4	6.3	6.2	6.2	6.1	6.0	6.0	3.6	5.8	3.0	2.4
	-	-	-	-	-	-	-	-	-	-	-	3.2	5.9	-	2.6
	6.8	6.7	-	6.6	6.5	6.4	6.4	6.3	6.2	6.2	6.1	2.9	5.9	2.5	1.4
MORJO	-	-	-	2.4	6.7	3.1	4.5	3.2	7.0	1.1	-	0.4	5.1	5.1	4.0
MOSFA	-	0.7	1.0	0.2	1.2	0.5	0.6	-	-	-	-	0.3	-	-	0.3
OTTMI	5.2	-	3.0	8.0	5.1	7.4	-	-	-	-	3.0	-	-	-	-
PERZS	-	4.4	-	-	5.4	7.5	7.4	4.7	5.6	-	-	5.1	2.3	-	6.9
ROTEC	1.5	0.7	-	-	5.5	5.4	5.3	1.5	5.2	5.1	5.0	2.4	4.9	-	0.4
SARAN	8.2	8.7	5.1	1.3	-	-	1.6	-	-	-	1.0	-	2.3	5.1	5.7
	8.1	8.7	7.9	0.9	-	-	1.2	-	-	-	1.2	-	-	5.0	8.0
	7.8	8.4	7.8	1.1	-	-	-	-	-	-	2.3	3.4	4.4	6.4	7.9
	8.2	8.7	4.1	1.9	-	-	1.6	-	-	-	1.5	2.9	2.2	6.8	8.1
SCALE	-	1.7	2.9	-	6.4	-	6.6	-	-	-	-	2.1	0.2	1.6	-
SCHHA	3.0	0.4	2.7	2.4	6.6	2.6	6.1	6.2	-	-	4.7	5.3	2.4	5.6	3.3
SLAST	-	-	4.0	1.1	6.1	7.1	6.9	4.1	2.1	0.7	-	-	-	-	-
	-	-	5.3	-	6.9	7.7	0.5	-	-	-	-	-	-	-	-
STOEN	-	3.8	3.2	-	7.7	7.7	7.7	0.3	0.2	-	-	6.3	0.3	0.5	0.2
	-	3.3	2.6	-	7.7	7.6	7.6	0.7	0.7	0.8	-	6.8	-	0.5	-
	-	4.3	3.2	0.2	6.1	7.8	7.8	1.9	1.1	1.6	-	6.7	0.2	0.5	0.2
STRJO	6.9	2.3	6.7	6.6	6.5	6.5	6.5	3.3	6.3	1.8	6.2	4.6	2.3	2.7	2.6
	6.7	2.9	6.7	6.7	6.6	6.5	6.4	3.1	6.2	4.3	5.9	5.6	2.4	1.8	2.9
	6.7	-	6.7	6.7	6.6	6.5	6.5	3.2	6.3	4.7	6.2	5.9	2.9	3.5	3.7
	6.9	-	6.7	6.7	6.5	6.5	6.5	3.3	6.3	4.2	6.2	5.2	2.9	3.1	4.1
	6.7	-	6.5	6.4	6.3	6.2	6.1	3.3	6.0	2.4	5.7	4.1	-	3.0	2.7
TEPIS	-	5.3	-	-	5.7	-	3.4	4.5	2.8	-	-	-	-	5.6	6.6
	-	3.9	-	2.1	4.0	0.5	2.2	2.3	2.9	-	2.6	-	-	5.6	6.5
TRIMI	-	-	-	-	0.4	1.8	-	1.0	0.7	0.7	-	0.2	-	-	-
YRJIL	1.0	3.8	1.8	3.4	3.2	2.7	2.6	2.6	2.4	2.1	1.9	1.5	0.9	-	-
Sum	260.1	304.3	253.6	206.6	336.9	316.1	310.5	202.2	216.6	151.3	178.3	205.4	142.7	168.0	221.8

May	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	3.1	-	-	1.7	-	3.0	3.6	1.1	-	-	2.8	4.3	4.2	4.5	4.3	1.7
BANPE	-	-	-	-	-	0.2	-	-	-	0.5	0.5	-	-	-	0.2	-
BERER	6.6	-	-	-	6.0	6.2	-	-	-	-	-	-	-	-	-	5.4
BOMMA	1.9	7.4	5.4	-	7.2	7.2	4.9	0.9	7.1	6.4	6.7	6.4	0.7	3.9	6.9	6.3
BREMA	-	-	-	-	2.6	0.5	-	-	-	4.8	4.2	0.8	-	-	4.7	0.8
BRIBE	-	2.1	0.4	4.8	2.6	2.0	-	-	-	5.1	-	3.4	3.4	-	2.6	-
	-	-	-	-	2.7	1.8	-	-	-	-	-	2.3	2.3	-	1.0	-
CASFL	5.4	7.0	-	6.1	7.1	7.0	5.1	2.3	4.8	6.9	6.6	6.7	5.9	-	-	-
	4.8	4.6	-	3.6	6.9	6.9	-	1.9	4.4	6.7	5.7	0.3	3.8	-	-	-
CRIST	2.0	5.0	0.2	-	-	-	0.3	3.7	2.8	-	-	-	-	-	-	1.9
	3.5	7.0	-	4.6	6.8	6.9	-	3.5	-	4.5	4.8	4.5	-	-	-	-
	2.3	7.0	0.6	2.7	6.9	6.8	2.1	5.3	4.4	5.3	5.7	4.4	4.5	0.6	1.0	2.1
DONJE	3.5	7.5	7.1	-	7.3	7.3	4.8	1.7	7.2	7.0	7.1	7.1	1.4	5.9	7.0	6.9
ELTMA	0.8	5.7	-	-	5.1	3.8	3.6	1.1	-	6.2	5.7	5.9	-	-	-	-
FORKE	-	-	5.6	-	2.9	5.8	1.1	-	-	-	4.6	3.9	1.6	1.5	3.2	0.6
GONRU	1.8	5.0	7.6	4.7	7.1	-	5.0	4.4	1.4	4.3	7.0	-	2.8	7.1	7.4	7.4
	1.8	5.5	7.8	4.8	6.5	0.5	5.2	3.9	0.7	3.5	6.7	1.4	3.5	6.2	7.5	7.5
	-	-	6.9	-	6.2	-	-	3.4	-	3.0	3.8	2.3	0.5	-	7.3	7.3
	-	4.6	7.7	4.7	5.6	0.3	4.7	3.9	0.5	3.5	5.6	1.6	2.0	7.1	7.4	7.5
	-	4.1	7.4	4.0	3.5	-	1.2	2.8	-	2.3	4.3	1.2	0.4	6.4	-	7.4
GOVMI	-	4.0	6.6	1.3	6.5	6.4	6.4	-	2.6	2.0	6.2	4.2	4.8	4.9	6.1	3.5
	-	1.3	6.2	0.3	2.9	5.5	6.5	-	1.6	-	6.3	3.3	3.3	4.0	6.1	3.2
	1.1	2.6	6.2	0.8	6.3	3.3	6.3	0.5	0.9	0.5	6.1	1.7	-	3.8	5.9	3.5
HERCA	8.9	8.9	4.7	7.4	8.8	8.8	8.8	8.0	8.7	8.7	8.7	8.6	8.6	8.6	8.6	8.6
IGAAN	-	-	-	-	-	5.8	6.2	3.8	5.2	6.0	-	5.2	4.7	-	6.1	5.8
JONKA	6.1	-	-	-	6.4	6.6	6.5	3.4	4.5	6.2	6.4	5.8	-	-	6.2	5.9
	4.9	-	-	0.7	6.6	6.5	6.5	3.1	4.4	6.4	6.3	-	5.8	0.7	6.2	6.1
KACJA	3.8	3.7	5.4	-	6.7	6.6	6.7	-	4.6	2.2	6.4	6.4	-	-	-	-
	0.5	2.9	2.1	-	6.8	6.9	3.1	-	6.1	4.8	6.6	5.7	4.8	-	-	-
	4.0	2.8	3.6	-	6.8	6.5	6.7	-	4.5	1.9	6.6	6.6	-	-	-	-
	3.8	3.0	2.8	-	6.7	6.6	6.6	-	4.7	2.4	6.6	6.5	1.4	-	-	-
KOSDE	-	-	-	-	-	-	-	-	8.1	-	-	-	-	-	-	-
	6.7	6.2	5.7	5.1	-	-	-	4.6	4.6	4.6	1.9	8.0	-	6.5	-	-
	-	-	-	-	-	-	-	-	-	5.9	8.5	8.2	8.4	8.1	8.2	8.3
	6.8	6.3	5.8	5.2	4.2	8.2	8.1	8.1	8.1	8.1	2.1	8.0	8.0	8.0	8.0	8.0
LOJTO	3.6	-	6.3	6.3	1.9	-	6.3	5.6	5.9	5.9	5.7	5.1	5.4	5.5	4.6	-
LOPAL	1.1	-	7.5	7.9	4.1	-	6.1	-	-	5.3	4.5	-	2.9	7.7	7.7	7.7
MACMA	6.1	-	2.6	2.5	1.8	1.8	5.7	5.7	0.5	5.5	4.0	5.4	5.4	5.3	3.2	0.2
	5.9	-	5.9	6.1	2.6	-	-	-	-	-	-	5.2	5.3	5.2	4.7	0.5
	6.2	-	6.1	6.0	5.4	3.9	5.8	5.8	2.6	5.5	5.5	5.5	5.5	5.5	5.3	-
	6.1	-	5.9	5.9	5.3	3.4	5.7	5.7	2.1	5.3	5.5	5.4	5.4	5.3	5.3	0.9
MARGR	-	-	-	-	-	5.3	-	7.7	8.0	-	-	-	-	-	7.1	-
MARRU	5.0	6.3	6.7	7.8	6.9	-	7.2	3.0	1.0	1.7	7.0	3.0	3.5	7.0	7.5	7.5
	1.2	7.4	6.9	7.6	3.7	-	3.7	-	-	5.1	4.5	-	1.3	6.6	7.6	7.1
MASMI	-	4.1	4.0	3.4	-	-	-	-	2.7	2.2	-	3.1	-	-	-	-
MOLSI	4.0	1.5	3.1	0.2	4.6	5.4	0.7	-	-	2.5	4.5	2.0	3.7	0.5	-	1.2
	2.4	1.3	1.6	-	3.9	6.1	-	-	-	3.0	5.2	2.2	4.2	-	-	-
	2.7	1.2	2.9	-	4.9	4.7	-	-	-	2.7	4.7	-	3.8	-	-	-
	4.3	1.8	-	0.6	-	4.4	3.1	-	-	-	4.8	4.8	4.4	3.3	4.7	2.9
	4.1	1.8	-	-	-	3.2	2.7	0.7	-	-	4.9	5.0	4.6	3.3	4.8	3.1
	-	-	-	-	-	-	0.9	-	-	-	-	-	-	-	-	-
	3.9	1.7	-	-	-	4.3	2.5	-	-	-	5.1	5.1	4.8	3.2	4.9	3.0
MORJO	-	4.3	-	4.5	5.9	6.6	6.6	-	-	4.4	6.3	1.7	6.2	4.2	6.3	6.2
MOSFA	-	-	-	0.3	0.2	0.7	0.5	0.2	0.2	0.3	0.7	-	0.3	-	-	-
OTTMI	7.6	7.5	7.5	3.6	7.4	7.4	7.3	5.8	-	-	-	0.4	6.7	0.3	-	7.1
PERZS	2.7	2.6	5.0	0.6	5.3	3.8	4.9	-	-	2.6	6.5	-	4.6	4.6	6.4	5.2
ROTEC	-	-	-	-	-	-	0.5	-	-	-	1.2	2.1	2.0	1.0	1.4	-
SARAN	1.4	5.2	4.7	4.6	-	-	7.0	-	-	6.9	4.1	-	-	5.8	8.0	7.6
	1.5	8.2	6.7	5.3	5.1	-	7.5	1.9	-	6.4	2.6	-	-	5.8	-	5.7
	-	8.0	6.6	5.2	6.7	-	7.9	3.0	-	7.2	3.8	-	-	6.9	1.3	5.6
	1.2	8.1	5.1	3.7	3.0	-	4.7	0.6	-	5.2	4.5	-	-	4.5	7.8	7.5
SCALE	-	6.8	0.4	-	5.2	5.5	3.6	2.9	3.1	6.5	5.3	-	-	0.3	0.3	2.2
SCHHA	-	0.2	-	4.4	2.7	2.1	-	-	-	1.8	-	-	-	-	3.5	0.7
SLAST	3.0	3.2	2.3	-	6.6	6.4	6.4	-	5.1	5.4	-	5.4	2.8	-	0.8	1.8
	-	-	-	-	-	0.8	1.9	-	4.7	5.3	6.7	6.8	-	-	-	2.7
STOEN	0.3	4.8	0.3	1.6	4.5	3.0	3.6	2.1	2.3	6.8	6.0	3.8	5.0	-	0.7	1.1
	1.2	5.6	0.4	0.9	5.7	7.1	4.1	2.4	3.2	6.9	6.7	4.8	5.4	-	0.3	1.7
	1.0	5.7	0.3	1.7	6.4	7.1	4.8	2.5	2.9	6.8	6.3	4.8	4.8	-	0.4	1.4
STRJO	-	3.3	-	3.2	0.3	-	-	-	-	0.9	1.4	-	-	-	-	-
	-	3.8	0.9	5.2	-	1.7	-	-	-	1.2	-	-	-	-	4.3	-
	-	4.5	-	5.2	-	3.3	-	-	-	1.2	1.1	-	-	-	4.7	-
	-	4.3	0.9	3.8	-	1.8	-	-	-	-	-	-	-	-	4.7	-
	-	2.9	-	4.7	-	-	-	-	-	0.8	0.4	0.9	0.7	-	4.6	-
TEPIS	5.7	-	-	5.2	6.3	6.2	6.2	-	-	6.1	6.0	4.4	4.5	1.4	5.8	5.8
	5.2	-	-	5.7	6.3	6.2	6.2	1.4	0.2	6.1	6.0	4.5	4.4	1.0	5.9	5.8
TRIMI	0.6	-	1.7	-	0.8	2.6	1.8	-	-	-	1.0	3.9	0.3	4.3	1.0	2.0
YRJIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum	172.1	230.3	208.1	186.2	285.2	258.7	255.9	128.4	146.4	263.2	303.0	230.0	194.7	186.3	257.5	219.9

3. Results (Meteors)

May	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	27	32	2	5	29	39	36	28	20	25	15	22	21	11	14
BANPE	-	-	-	-	-	3	5	3	-	-	-	-	-	-	4
BERER	-	-	-	-	-	-	-	-	-	-	-	-	-	21	24
BOMMA	-	10	-	10	30	26	4	-	1	-	-	1	-	1	3
BREMA	6	-	10	12	14	14	12	-	6	1	10	4	-	8	7
BRIBE	9	1	17	13	11	16	19	14	13	3	14	10	3	8	7
	11	1	17	6	7	14	17	8	-	11	9	8	2	-	2
CASFL	-	17	25	2	18	23	10	-	-	1	-	10	7	4	11
	-	14	10	1	9	8	8	-	-	-	-	6	2	-	12
CRIST	6	25	21	35	28	5	5	-	-	-	-	-	8	2	10
	4	13	14	24	22	2	3	-	-	-	-	-	-	6	5
	9	30	31	42	48	7	11	-	1	-	-	1	14	5	17
DONJE	-	4	4	8	39	34	4	1	-	1	-	2	-	2	4
ELTMA	-	9	-	-	25	18	16	-	-	-	-	14	-	-	-
FORKE	11	20	-	-	20	21	13	9	19	19	20	-	-	1	-
GONRU	28	27	33	-	-	2	-	-	3	7	3	3	7	1	7
	27	18	33	-	-	3	-	-	3	9	3	7	4	1	4
	11	14	8	-	-	1	3	6	-	4	-	1	-	-	-
	16	19	16	-	-	3	-	-	1	9	-	4	8	4	3
	23	23	23	-	-	3	8	9	3	3	-	2	6	2	1
GOVMI	-	6	1	-	5	5	19	3	2	-	-	6	1	-	12
	-	1	-	-	2	-	7	4	3	-	-	1	-	-	-
	-	3	1	-	3	6	8	-	3	-	-	12	-	-	3
HERCA	15	18	25	21	15	15	13	18	20	24	17	9	12	13	7
IGAAN	-	-	-	-	3	-	2	1	-	-	1	-	-	-	-
JONKA	-	-	-	4	12	-	8	4	-	-	2	-	-	5	4
	-	-	-	3	4	-	4	2	2	-	3	-	-	5	4
KACJA	-	-	4	-	15	25	29	13	15	-	-	-	-	-	-
	-	-	11	-	12	22	13	4	6	2	-	1	-	-	-
	-	-	4	-	18	33	26	45	20	-	-	-	-	-	-
	-	-	-	-	-	-	17	13	10	-	-	-	-	-	-
KOSDE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	72	84	-	89	85	105	34	56	1	-	31	85	87	78	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	89	65	-	95	91	101	38	73	-	-	17	68	71	70	65
LOJTO	-	-	5	9	9	9	13	21	14	10	7	9	-	-	14
LOPAL	4	6	2	-	-	-	-	1	-	1	1	-	-	1	2
MACMA	1	8	7	18	9	23	2	6	13	13	6	23	-	-	16
	2	5	7	17	8	14	7	3	15	10	12	17	-	-	10
	6	6	4	15	5	9	1	6	13	6	10	8	-	-	13
	6	8	4	11	8	14	3	8	21	17	13	17	-	-	17
MARGR	7	7	-	-	-	-	1	-	-	-	-	-	-	-	-
MARRU	22	15	13	-	-	13	2	-	2	6	7	7	15	18	11
	24	13	6	1	-	-	-	1	-	-	1	-	5	11	15
MASMI	9	3	17	-	14	3	2	1	10	6	2	1	14	-	-
MOLSI	9	27	-	51	47	59	45	55	38	23	14	-	-	11	-
	4	7	-	12	23	11	10	13	11	7	5	-	-	9	-
	6	12	-	24	26	27	20	29	13	18	7	-	-	10	-
	43	26	-	23	29	32	27	31	32	31	23	15	28	7	1
	27	39	-	31	33	39	32	29	27	31	21	15	24	7	9
	-	-	-	-	-	-	-	-	-	-	-	5	22	-	3
	44	39	-	33	43	38	38	30	32	33	18	9	20	1	4
MORJO	-	-	-	3	9	1	6	5	5	1	-	1	2	2	2
MOSFA	-	4	7	1	7	3	4	-	-	-	-	2	-	-	2
OTTMI	9	-	5	7	4	3	-	-	-	-	7	-	-	-	-
PERZS	-	5	-	-	2	38	33	7	12	-	-	14	1	-	11
ROTEC	10	6	-	-	10	11	10	3	10	8	6	4	10	-	1
SARAN	13	9	5	1	-	-	4	-	-	-	1	-	4	6	6
	14	18	7	2	-	-	2	-	-	-	1	-	-	6	12
	20	21	13	1	-	-	-	-	-	-	1	4	5	8	18
	12	12	4	3	-	-	2	-	-	-	1	1	1	5	10
SCALE	-	1	2	-	7	-	6	-	-	-	-	5	1	1	-
SCHHA	6	1	1	4	12	2	15	10	-	-	8	6	1	13	6
SLAST	-	-	6	2	6	16	18	5	3	1	-	-	-	-	-
	-	-	3	-	6	7	3	-	-	-	-	-	-	-	-
STOEN	-	16	24	-	26	35	31	2	1	-	-	38	2	3	2
	-	4	23	-	46	29	29	4	3	2	-	34	-	2	-
	-	10	24	1	34	31	33	7	1	1	-	34	1	5	1
STRJO	16	1	28	20	28	21	36	9	17	8	24	15	4	12	9
	11	1	18	9	17	21	17	9	11	3	13	8	2	3	3
	4	-	6	7	3	7	6	4	5	2	5	4	1	1	1
	8	-	18	9	12	12	17	13	9	4	7	4	3	3	12
	11	-	10	10	11	22	12	9	5	1	10	8	-	6	4
TEPIS	-	3	-	-	2	-	2	13	2	-	-	-	-	5	9
	-	3	-	2	7	2	4	15	4	-	1	-	-	6	11
TRIMI	-	-	-	-	2	5	-	3	3	1	-	1	-	-	-
YRJIL	2	5	1	5	9	5	4	1	4	4	3	2	1	-	-
Sum	714	795	580	702	1079	1116	889	667	488	367	380	588	420	410	465

May	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	13	-	-	5	-	5	7	1	-	-	7	16	17	15	16	3
BANPE	-	-	-	-	-	1	-	-	-	3	3	-	-	-	1	-
BERER	22	-	-	-	9	12	-	-	-	-	-	-	-	-	-	21
BOMMA	6	16	10	-	10	19	17	5	23	16	10	10	3	9	22	20
BREMA	-	-	-	-	2	2	-	-	-	2	3	1	-	-	2	1
BRIBE	-	3	2	8	2	6	-	-	-	7	-	6	6	-	12	-
	-	-	-	-	1	3	-	-	-	-	-	2	4	-	1	-
CASFL	18	18	-	15	14	17	8	2	12	12	6	9	12	-	-	-
	8	5	-	9	7	6	-	5	4	8	7	1	4	-	-	-
CRIST	6	12	1	-	-	-	2	11	6	-	-	-	-	-	-	3
	4	10	-	11	11	17	-	12	-	3	5	6	-	-	-	-
	12	22	4	15	16	32	4	26	11	10	12	12	7	4	1	6
DONJE	5	28	15	-	18	21	11	4	18	28	18	20	7	15	21	29
ELTMA	2	12	-	-	8	8	12	3	-	13	6	8	-	-	-	-
FORKE	-	-	5	-	3	7	5	-	-	-	5	5	4	1	7	2
GONRU	3	6	14	12	12	-	12	9	1	10	14	-	5	19	24	28
	1	2	11	3	8	2	6	7	1	10	11	3	4	8	10	15
	-	-	4	-	4	-	-	5	-	1	4	1	1	-	8	9
	-	5	11	1	5	1	8	10	2	11	11	2	1	12	11	19
	-	1	18	3	2	-	1	6	-	4	4	1	2	7	-	15
GOVMI	-	6	10	3	6	7	10	-	2	3	12	1	3	11	15	9
	-	2	6	2	2	8	12	-	4	-	5	5	1	8	8	7
	1	6	8	1	3	3	7	3	1	1	7	4	-	5	9	7
HERCA	16	12	11	10	14	12	16	17	11	10	13	10	13	12	12	11
IGAAN	-	-	-	-	-	1	2	1	2	3	-	3	1	-	3	2
JONKA	7	-	-	-	5	4	4	2	3	6	4	3	-	-	4	6
	7	-	-	1	5	2	4	2	6	10	5	-	3	1	9	8
KACJA	11	11	13	-	16	12	30	-	6	6	15	12	-	-	-	-
	2	1	1	-	7	15	10	-	22	9	14	17	2	-	-	-
	20	13	14	-	25	15	25	-	8	4	21	22	-	-	-	-
	5	7	4	-	9	10	14	-	3	2	9	7	1	-	-	-
KOSDE	-	-	-	-	-	-	-	-	54	-	-	-	-	-	-	-
	63	74	73	64	-	-	-	39	44	46	14	82	-	55	-	-
	-	-	-	-	-	-	-	-	-	43	75	69	72	84	66	87
	35	51	44	41	26	28	21	39	54	54	14	45	70	68	54	79
LOJTO	5	-	13	11	2	-	8	8	16	15	15	6	5	23	13	-
LOPAL	1	-	1	1	1	-	3	-	-	2	5	-	4	3	2	6
MACMA	19	-	14	18	8	1	4	11	2	10	19	15	13	17	7	1
	13	-	5	11	6	-	-	-	-	-	-	9	11	14	9	1
	11	-	7	10	3	1	1	5	2	7	6	7	2	7	5	-
	11	-	11	18	8	5	10	9	4	14	15	15	8	17	14	4
MARGR	-	-	-	-	-	2	-	9	6	-	-	-	-	-	6	-
MARRU	3	3	15	27	5	-	15	4	2	2	16	6	1	8	15	12
	6	9	11	9	4	-	2	-	-	8	6	-	3	9	12	6
MASMI	-	13	9	6	-	-	-	-	4	6	-	11	-	-	-	-
MOLSI	7	5	5	1	4	21	2	-	-	5	17	19	20	2	-	7
	5	3	5	-	5	17	-	-	-	5	12	4	4	-	-	-
	5	9	3	-	3	16	-	-	-	7	8	-	7	-	-	-
	20	7	-	1	-	10	9	-	-	-	9	18	23	15	28	8
	19	3	-	-	-	3	10	1	-	-	9	16	24	9	19	10
	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-	-
	14	2	-	-	-	6	2	-	-	-	10	10	28	13	20	5
MORJO	-	5	-	3	5	7	5	-	-	5	6	1	2	4	5	8
MOSFA	-	-	-	2	1	4	3	1	1	2	4	-	2	-	-	-
OTTMI	9	9	5	3	7	5	4	3	-	-	-	3	4	2	-	10
PERZS	5	5	7	1	8	1	13	-	-	2	17	-	3	21	15	10
ROTEC	-	-	-	-	-	-	1	-	-	-	2	3	3	1	3	-
SARAN	3	10	6	6	-	-	3	-	-	8	4	-	-	4	4	5
	3	16	12	13	7	-	7	1	-	6	3	-	-	14	-	5
	-	11	16	21	7	-	11	4	-	18	1	-	-	12	1	15
	1	5	7	3	2	-	2	1	-	2	1	-	-	4	16	6
SCALE	-	4	2	-	2	2	2	1	5	4	5	-	-	1	1	6
SCHHA	-	1	-	6	4	1	-	-	-	4	-	-	-	-	9	1
SLAST	5	4	1	-	2	2	9	-	9	4	-	5	1	-	3	10
	-	-	-	-	-	4	2	-	4	1	4	8	-	-	-	1
STOEN	1	21	2	11	16	12	10	7	6	14	6	8	21	-	4	4
	4	11	2	4	19	15	14	7	13	15	12	9	17	-	2	3
	5	18	3	9	19	18	8	12	8	9	10	5	20	-	3	3
STRJO	-	7	-	4	2	-	-	-	-	2	2	-	-	-	-	-
	-	1	2	4	-	3	-	-	-	1	-	-	-	-	13	-
	-	1	-	4	-	3	-	-	-	1	2	-	-	-	6	-
	-	7	1	3	-	4	-	-	-	-	-	-	-	-	9	-
	-	1	-	3	-	-	-	-	-	1	1	1	1	-	11	-
TEPIS	4	-	-	1	3	4	6	-	-	6	5	3	1	1	5	5
	5	-	-	3	6	9	12	2	1	9	13	4	4	1	12	12
TRIMI	2	-	4	-	4	4	4	-	-	-	2	7	1	6	5	4
YRJIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum	453	514	448	421	413	456	432	295	381	530	581	576	476	542	593	555